



Ø BEAT



COLORADO SPRINGS,
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APRIL 1986

FIFTY CENTS AN ISSUE / \$4 PER YEAR

PIKES PEAK RADIO AMATEUR ASSOCIATION, INC.
P.O. Box 16521
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Ø BEAT



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ZERO BEAT is published monthly in the interest of the members of the Pikes Peak Radio Amateur Association, Inc., P.O. Box 16521, Colorado Springs, Colorado 80935. Cost is 50¢ per month for non-members or a \$4.00 per year subscription. Permission is given to reprint articles or excerpts provided credit is given. Deadline for submission of articles is the 21st of the month. Classifieds accepted anytime.

The Pikes Peak Radio Amateur Association meets on the second Wednesday of each month at Giuseppe's Depot Restaurant at 10 S. Sierra Madre at 7:30 p.m. All amateurs and interested parties are invited to attend.

Editor: Phil Somers VE1ARC, 1075 Allegheny Dr. Colorado Springs, CO 80919 590-7136

EDITORIAL NOTES

Well, this is my second issue since taking over as editor, and thanks to the help of a number of the members, there were lots of articles to fill up the pages this month. It was nice to see a technical article on the subject of mobile antenna tuning. We could certainly use more articles along those lines. And new this month is a VHF column. I have had a couple of other offers of a regular column, and those would be most welcome. As you will see from the cartoons, a talented cartoonist would be a welcome addition to the staff. As with the previous month, there are quite a variety of articles. Your comments, good or bad, are solicited so that the articles can be tailored to the interests of the members.

We tried something new this time. Larry, NQAMP set up his computer as a bulletin board and we transferred a whole bunch of material over the phone. If you have a modem, you might try that for the next issue.

I get to attend the Board meetings as the editor and get to see all the good work the Board is doing on your behalf. What they really need to carry on this good work are more volunteers to work on the numerous committees that are essential to the well-being of the club. So if you can find some time to help out, I'm sure it would be much appreciated, and you would feel good about it.

I think the thing I enjoy the most about the club in the short time since January that I have been here is Saturday breakfast. I've not missed one in three months so there must be something good to get me up at six on a Saturday morning. If you have not been out recently, why not try it next week. You may be surprised at the crowd on hand. We are currently meeting from about 7:00 to 9:00 at the Village Inn at the Rustic Hills Mall, but we sometimes change locations so monitor a repeater or .52 for any changes.

It is spring, the SwapFest will soon be here, so why not clean out your shack and sell all that "junk" you don't need any more. You will be able to pick up a lot of new "junk" to replace it and everyone will be better off.

Don't forget about the Dayton Hamvention. I was living in Dayton last year, and had a ring-side seat for all the action. They have about 10 acres of "flea market" and almost that much of new gear. Computers and computer components were real plentiful last year. When you are in Dayton, reserve several hours for the fantastic Air Force Museum. Dayton was the home of the Wright Brothers so be sure to visit some of the historical spots. Carillon Park has a replica of their bicycle shop and a number of other very interesting exhibits. Another highlight is Mendelson's Electronic Surplus warehouse. They claim it is the world's largest, and are probably right. Dayton has many many repeaters. Monitor .94 for Hamvention details, including talk-in and parking information.

Last month I commented on an easy way to prolong HT battery life: stop "over-identifying". Stop identifying others; the rules only require one's own ID.

Not long after writing that, I was passing the time of day with a group of hams over coffee (decaf). The topic got around to how one of the newer licensed hams in the area failed to ID "properly" (according to their understanding).

It soon became apparent that they, not the newcomer, were more often not ID'ing as provided by regulations. They still live in the days of yore: redundant ID'ing. It led me to think that some folks, at an early age, had a bug fly in their ear -- and it's probably still there, because there's so much room for it to fly around...

To the contrary, the newcomer was ID'ing correctly: giving her callsign as required: at the end of a contact, or at 10 minute intervals during the contact.

Help the ARRL: they publish a fine book on the subject - buy it - then read it. And then: do it right!

Did you ever have to drive through Kansas from one end to the other? Thank heavens for repeaters. It's a long, long drive through mostly nothing. In winter, it's storm-ridden, potentially dangerous; in summer, it's burned up. Only in spring does it appear decently habitable.

The scattered tiny hamlets are often marked by 3-pump gas stops, a general store and a greasy spoon. All three are usually occupied by native males in bib overalls, topped by baseball caps bearing farm implement logos. If you listen, you likely will hear a discussion of the news of the day: how someone couldn't get his pickup started that morning.

If you're in Kansas in winter, a word to the wise: you'll need long

underwear, woolen mittens, stocking cap and a ski mask - and if you get out of bed, you'll need even more...

What one repeater group is doing about SKYWARN - and others could follow. It's the Lake Erie Amateur Radio Association (LEARA) in Cleveland, OH., currently operating 6 repeaters (including a digipeater).

A pioneer club in weather spotting and reporting, often recognized for many years of SKYWARN service, LEARA has now documented all SKYWARN frequencies used in Ohio by counties so as to facilitate priority weather message traffic; they can "dial-up" far distant repeaters remotely so as to access them for SKYWARN service; the LEARA station at the NWS (National Weather Service) office now has HF capability as well as 2 & 220, and packet and RTTY are being installed.

Amateur radio public service through SKYWARN was featured on northeastern Ohio TV during a 30 minute show on tornado awareness on March 29th, too, giving excellent publicity to amateur radio and to the service hams perform in the public interest, thanks to LEARA and other clubs in the Ohio SKYWARN network. While some folks fidget about "becoming involved," LEARA is forging ahead to serve the citizens in its area while, at the same time, promoting and making friends for Amateur Radio.

If you're not ready to assist your local SKYWARN program here in Colorado, why not? It's a service that amateurs are often uniquely able to provide, either mobile or fixed. Get involved - learn correct reporting - help show the public that we provide a service in time of need. In doing so, we might also win over converts to speak up for us in other matters (against unrealistic antenna restrictions, perhaps?) While there is currently some opposition apparent in mutterings out of the Commission on amateur radio public service and the National Weather Service, that doesn't stop storms and tornados from happening, and lives from being endangered - so let's press on in the public interest for now. 73

"VHF AND ABOVE" NEWS
by Ron Deutsch NK0P

A record aurora was reported by amateurs all across the U.S. on February 8th. A number of transcontinental contacts were logged due to a rare form of propagation known as auroral E. KH6s were worked as far east as Minnesota, and HC2FG in Ecuador had a field day working stateside stations.

A new DX record was claimed on 144 MHz aurora by WB0DRL in Kansas and KA1ZE in Connecticut, a path of 1348 miles.

The aurora even made its presence felt on 432 MHz, but with 3 to 4 KHz doppler shift between actual and apparent frequencies, contacts were much more difficult.

If this form of ham radio interests you, listen on the following frequencies here in Colorado Springs: 50.110, 144.2, 432.10, 1296.1 (SSB or CW). You will be rewarded with signals from Kansas, New Mexico, Texas and Nebraska which can be worked most any evening with a single long-boom yagi and modest power. I can work Cheyenne, Wyo. on 10 watts most evenings on 2 meters. April meteor scatter will peak on 21 April at 1930Z +/- 12 hours (Lyrids Shower).

A UHF conference is scheduled for this fall in Estes Park, Colorado sponsored by WOPW. Watch this column for details.

Beginning Feb 1st, the U.K. will be on 50.0-50.5 MHz. Look for your U.K. friends on 6 meters as the F-2 skip rolls in.

I will try to print items of interest to VHF/UHF operators each month. All suggestions and material will be greatly appreciated! 73's - Ron NK0P.

IDEAS FOR O-BEAT ARTICLES

Here are a few ideas that might help generate some articles for your newsletter. You can submit a full article, nicely typed in columns, or simply send the editor some hand-written notes, or anything in between. Even suggestions for articles are most welcome. It is important that as much of O-Beat as possible be made up of news and articles from the Pikes Peak region. It is up to you to make it happen.

- Pikes Peak Packet column or news.
- a recent project you have done.
- for sales and want-ads, remember they are free to members.
- a tour of your shack.
- your most memorable QSO.
- your best DX.
- a report back from the Dayton Hamvention.
- suggestion for club activities.
- how can the monthly meetings be improved.
- propagation you have seen.
- hints and kinks from your bench.
- a neat circuit you have used.
- a new antenna you are using.
- a review of your new rig.
- a amateur radio book review.
- how to use a piece of test equipment.
- a ham-computer interface.
- some club history.
- a suggested public service.
- a neat QSO you overheard.
- what's new on RTTY on 20m.
- what have you done on CW lately.
- where to shop for parts and junk in the Pikes Peak region.
- news from other local ham clubs.
- awards you have won.
- awards you are trying to get.
- suggestion for a club award.
- a hill climb news report.
- do we need a club station.
- what is the weather net.
- what are some other interesting nets.
- lets see your new QSL card.
- "operating" during your trip.
- is anyone on amateur TV.
- do you have a technical question.
- do you have a ham quiz.
- can you draw a ham cartoon.
- etc, etc, etc

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The ARRL Letter excerpts from Vol 5, No 6.

ATTENTION CERTIFICATE HUNTERS AND AWARDS CHASERS

Please note that Minute 50 of the January ARRL Board meeting now permits ARRL awards credit, other than for five-band awards, on 24 Mhz and on 18 Mhz for those countries who have authorized it for amateur use. (No award credit is allowed on the 10 Mhz band because of our secondary status on that band.) Now, who will be the first to WAS on 24 Mhz? Field Day ops should note that Minute 67 now allows Field Day credit on 24 Mhz.

GMT GONE?

Yes, Greenwich Mean Time is gone! The reason? The high cost of maintaining the atomic clocks at the Greenwich Observatory in England. Effective last December, it was replaced by Universal Coordinated Time, kept by some 150 atomic clocks around the world.

"EXPO 86" AMATEUR EXHIBIT

There will be an Amateur Radio exhibit on the main floor of the Canadian Pavilion at Expo 86 in Vancouver. The theme of the exhibit will be "Communications for Everyone". The exhibit will stress the public service aspects of amateur radio, and will demonstrate the latest in amateur radio technology, including DSCAR satellites, amateur television and packet radio.

DX NOTES

Tonga: ZL1AMD was active as A35EA. He will be going to Western Samoa as 5W1CW, followed by Tokelau as ZK3RW. ZL1BGD will also be active from Tokelau as ZK3RAA. Malaysia: 9M2HB has been on 14227 Khz regularly from 0001Z. Central African Republic: F6DCL/TLB has been active on 14022 Khz around 2145Z. QSL via F6KFI. Comoros: D6BWS has been active on 14183 Khz at 1900Z. Franz Josef Land: UA1OT has been active on 7003 Khz at 0200Z. Norfolk Island: VK9NB has been active on 7003 at 0630Z. Diego Garcia: VQ9SK has been active daily from 1500Z to 1800Z on 21280 Khz. QSL via WB6SKS. Solomon Islands: H441R is active on 21022 Khz about 1600Z. QSL via I4FBB. 5H3CE is active on 14040 Khz at 1900Z. QSL via 1K6BOB.

PACKET NEWS

from Gateway:

The ARRL Packet-Radio Newsletter
Volume 2, Issue 11, Jan 24, 1986

KANTRONICS V 2.0 FIRMWARE

Kantronics has announced the availability of version 2.0 firmware for the Kantronics Packet Communicator. New features are:

- o AX25L2V2
- o Multiple Connects

Price for the upgrade is \$20.00 and will be available on February 3rd.

Via DRNET

IBM PC TERMINAL PROGRAM

If you are using an IBM PC or compatible to interface with your TNC, then you may be happy to know that a terminal program for the PC has been developed. Norm Wilcox, W2BRH, has written a packet terminal program called QPACKET based on the popular PC-TALK communications software. According to Norm, the software acts very much like PC-TALK, and uses the same basic command structure. Some of the features included in QPACKET are:

- o PC-TALK like commands
- o TNC initialization file
- o Split-screen operation
- o ASCII and Binary file transfer
- o Auto-answer
- o Remote file transfer

For more information, contact:

Norm Wilcox, W2BRH
RD #5 Box 82
Kingston, NY 12401

From W2BRH

HAPN ANNOUNCES IBM PC PACKET ADAPTER

The Hamilton Area Packet Network, (HAPN) a packet-radio club dedicated to furthering the state of packet radio, has announced the availability of the HAPN Packet Adapter Card for the IBM PC/XT/AT.

The HAPN adapter is unique in terms of its versatility and ease of operation. It is designed for the IBM PC and compatibles. The IBM PC or compatible is rapidly becoming a leader in the amateur community because of its attractive price and excellent performance.

The HAPN packet adapter is a card that plugs directly into one of the slots of the PC. It contains a built-in modem which interfaces to the radio with a DB9 connector. The card is 8.5 inches (22 cm) long and contains a prototype area. The software is powerful and is a delight to use. The transfer of ASCII or binary files is very simple by using the function keys on the keyboard. A popup menu allows you to set up the repeater routing table. Optional software is available for bulletin board operation. Experimental protocols such as VADCG V1 and V2 are also available.

Features of the H.A.P.N. packet adapter:

1. In addition to the AX.25 protocol it also runs the Canadian experimental protocols V1, V2 as designed by Doug Lockhart, VE7APU, of the VADCG (Vancouver Amateur Digital Communications group).
2. Software available at present:
 - a. AX.25 host support (included)
 - b. bulletin board program PCRBBS (optional)
 - c. file transfer programs (optional)
 - d. experimental protocol support for VADCG V1, V2 (optional)
3. The HAPN adapter plugs into a PC, PC-XT, PC-AT or compatible. No external cabinet or power supply is required.
4. Simple to interface to your radio. It requires RX audio, TX audio and push-to-talk. The carrier detect (radio channel busy) is generated internally from the received data or optionally brought out from your squelch circuit.
5. Built-in modem is Bell 202 compatible. It uses the XR2206 and XR2211 chipset. The tones are 1200 and 2200hz. The data rate is 1200 bit/s. A hardware watchdog circuit prevents possible TX runaway problems as a result of power glitches or lightning.

6. The board contains a pre-drilled prototype area for personal use.
7. The adapter is based on the INTEL 8273 MDLC/82LC protocol controller chip with a straightforward interface to the PC.
8. The low level software (device driver) is interrupt driven and stays resident in the PC allowing the adapter to function in the background. An application program such as bulletin board, file transfer or terminal program does not have to be resident for the adapter to function. In this mode, the user is alerted to a caller by a connect alarm utilizing the PC's speaker.
9. Easy customizing for the user. The user configuration such as call sign/SSID, auto logging of packet activity to disk, default repeater, connect alarm etc, are set up using the configuration screen and remembered by the program. These options can be changed at any time.

ORDERING INFORMATION AND PRICE :

All prices are in US\$ and include postage and handling in USA or Canada. Please add \$3 for overseas orders.

1. Assembled and tested board with AX.25 host software and self-test program (4 programs and documentation) \$199.00
2. Bare board with AX.25 software and construction details \$75.00
3. AX.25 software \$40.00
4. Bulletin board & file transfer programs \$25.00
5. Advanced VADCB experimental software \$25.00

Make checks and money orders payable to H.A.P.N.

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ARRL Bulletin Nr 19

March 14, 1986, Edited by K1BC

VHF packet radio got a big boost today. At ARRL request, the FCC suspended parts of its rules to permit third party traffic by packet stations under automatic control. Several conditions are attached to the waiver. Provisions of Sec 97.80(b) and 97.114(b)4, which were both to be added to the rules March 14, are waived to permit Amateur stations retransmitting digital packet radio communications on 50 MHz and higher bands using AX.25 or compatible protocol to be operated under automatic control while retransmitting third party traffic.

This waiver applies only to the retransmission of third party traffic originated at another Amateur station which is under local or remote control. When an Amateur station is operated under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the Amateur station. This waiver will remain in effect until the Commission takes final action on the petitions for reconsideration filed in PR Docket 85 105.

Amateur packet operators must be alert to the increased dependency upon them for monitoring during the period of this waiver. They should immediately make known to the responsible control operator of an automatic packet station any misuse of his station so the licensee can take corrective action. In summary, VHF packet radio may continue under automatic control.

MOBILE ANTENNA TRIMMING

by Hal Ethridge WBORER

There comes a time when a new or used Mobile Antenna (the loaded type with a thin steel rod that you trim for matching) finally must be trimmed so that it has low SWR on the frequency you wish to use it on. This is a very frightful moment (trim too much and you have lost your investment). The instructions for this type of operation, if you still have them, tell you to grind off "in small increments" this hardened steel wand until you reach the lowest SWR. This material is very hard and careful grinding to get an optimum match can take a lot of labor and time to get to the exact length. Note: most of these steel wands are secured to the main antenna element by means of a set screw, and the strongest final configuration is with the wand as far into it's socket as possible or "bottomed out". I have used several methods to circumvent this long drawn out process, but my favorite and by far the easiest is as follows:

1. If the antenna is new (wand not previously trimmed) and to be used on it's intended range of frequencies, remove it from it's socket, measure it and lay it aside.

2. Find a piece of stiff wire the same thickness or slightly thinner, (coat hanger, bailing wire, whatever) and cut slightly longer than the wand. If the antenna was previously modified or you are changing the range of operation, cut it even longer.

3. Insert the wire into the socket as far as it will go and tighten the set screw just enough to make the electrical connection. Don't over do it and strip everything.

4. At this point, fire up your rig on the desired frequency, put your SWR measuring device in line and check your SWR. If we have done everything right to this point, your SWR will be high, but you will know that the antenna is on the long side.

5. With a set of wire cutters, start snipping off small portions of the wire from the top of the antenna, and alternately checking the SWR. Don't worry

if you go too far. Just get a new piece of wire and start again. When you finally decide that the SWR is the best that you can get, loosen the set screw, remove the wire, and cut the original wand to the exact length of the wire. If the wand for some reason (previously modified or you are changing the range of operations) is too short, replace it and cut to the exact length of the wire.

6. Insert the wand into the socket until it bottoms, lubricate the set screw to prevent rusting or oxidization, and tighten down firmly. Don't strip it! Note: if there is a metal ball on top of the wand, this may act as a capacitance hat and change the SWR slightly, but it will not make the wand too short.

At this point, check your SWR again and, if all works for you as it has for me, you will have a well-tuned antenna. Save the wire you used for future reference, or you may want to record the length in your log book.

"LOCAL QRM"



"Watch your feet Joe !!!"

PPRAA SWAPFEST 1986
by J. R. Sorrells W9ABB

As most of you have probably heard by now, our swapfest is scheduled for Saturday May 17th. We have a great location in the Rustic Hills Mall. There is plenty of free parking. Best of all, the rent is free. But as with most things, nothing is perfect. Since it is open to the public, we cannot charge admission. But, on the other hand, it will be a good opportunity to get public exposure for our club and ham radio.

This year the grand prize is an Icom IC-R7000 VHF/UHF Receiver which covers 25 to 2000 mhz. It has a list price of \$899, but the club was able to get it at a considerable discount thanks to cooperation from Icom. Since we are unable to charge admission, we will have to sell raffle tickets for \$1 each. (I can hear the groans now.) Actually it should not be such a formidable task. The club has about 100 members. If each member sells or buys only 5 tickets, we should break even on the grand prize. Besides, I know what super salesman some of you OM's and YL's are; we'll probably have to print extra tickets. The main reason the IC-R7000 was chosen was so that it might also appeal to non-hams and increase our market for the raffle tickets.

Ron (N00P) has found a good source for table rentals at a very reasonable price. We are going to charge \$8 for pre-registered tables and \$10 at the door. The tables are 8 footers and plenty big, so you could share a table with a friend and split the cost. Rental of five or more tables will be \$6 per table. We already have 24 pre-registered. Our goal is to rent at least 100 tables. If you want to pre-register, contact Jim Sorrells (598-7543), Ron Deutsch (593-8352), or Al Vrooman (473-1660). We will need some able bodies the evening before the swapfest and after the swapfest to help in unloading and loading the tables. We can count on you, can't we?

Things seem to be shaping up quite well. We have already printed flyers and distributed them to several of the ham

radio stores in Denver. We are going to try to get public service announcements on the local radio and television stations, repeaters, and newspaper. We also hope to distribute flyers and sell raffle tickets at the Aurora and Boulder swapfests which are a few weeks before ours. We plan to have demonstrations and an information booth for the public. There will be an AMSAT display, VE testing, and an ARES display. Miley's Radio will be there. Ron and I are trying to talk CW, Colorado Radio and Walkers Electronics into showing up. If any of you have any other ideas, please give us a call.

The club has a chance to put on a very nice swapfest this year. Let's make it a class event. The swapfest committee is very enthusiastic and trying to do a good job for the club. Please give us your support. With your help, it is bound to be a success.



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$ There will be a special prize for the $
$ member who submits the best article $
$ that gets published in the May or $
$ June issue of Q-Beat. Judging will be $
$ by all the members present at the $
$ June meeting. $
$                                     $
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TAB BOOKS

MINUTES OF MARCH GENERAL MEETING
submitted by Al NOCMW, secretary

The general meeting of the Pikes Peak Radio Amateur Association was held on 12 March 1986 at Giuseppe's. The meeting was called to order by Les KCONC at 1930 MST. The regular introductions have those present give their name, call and what they do in amateur radio. This month, Les asked those assembled to introduce themselves, and give their profession. The minutes of the last meeting were approved as printed in O-Beat.

Committee Reports

RFI - Ron NKOP: Nothing new.

Field Day - Tom ADOD: 28-29 June.

SWAPFEST - Ron NKOP: SwapFest will be May 17 at Rustic Hills Mall. Help is needed from members. Grand prize is an ICOM 7000, 25 MHz to 2 GHz all mode. Tickets are \$1.00. Committee meeting to be held at home of Jim WA9ABB on Wednesday, 19 March.

Education - vacants: Urgently need a chairman for this committee. Main task would be to manage activities of this committee.

It was suggested that some one-on-one help to prospective novices might be appropriate for the club. An "Elmer" volunteer list was circulated.

Colorado Council of Amateur Radio Clubs (CCARC) - Bud NODDF: Dues of \$15.00 sent in.

Public Service - Mike KOTER: Need volunteers for Walk for Mankind on Apr 12, and March of Dimes on Apr 27 from 8:00 to 16:00.

Deaf and Blind School - Jim WA9ABB: Currently four students.

Public Relations - vacants: Need a volunteer for this position. (Note: since meeting, Ron NKOP has volunteered.)

O-Beat - Phil VE1ARC: Request that everyone try to submit some articles for the newsletter.

Old Business: Springs Nursing Home still needs a volunteer to inform them of amateur radio.

New Business: Vacancy existed on the Board because of departure of Frank KL7IPV. Board had recommended Jim WA9ABB. No other nominations from the floor. Jim was elected by acclamation.

Announcements:

Bud WBOTIB: Weather spotter's class at 1:30PM on Sunday, April 20 for 2-3 hours, most likely at Ford Aerospace. Watch for a new FM Association 440 repeater.

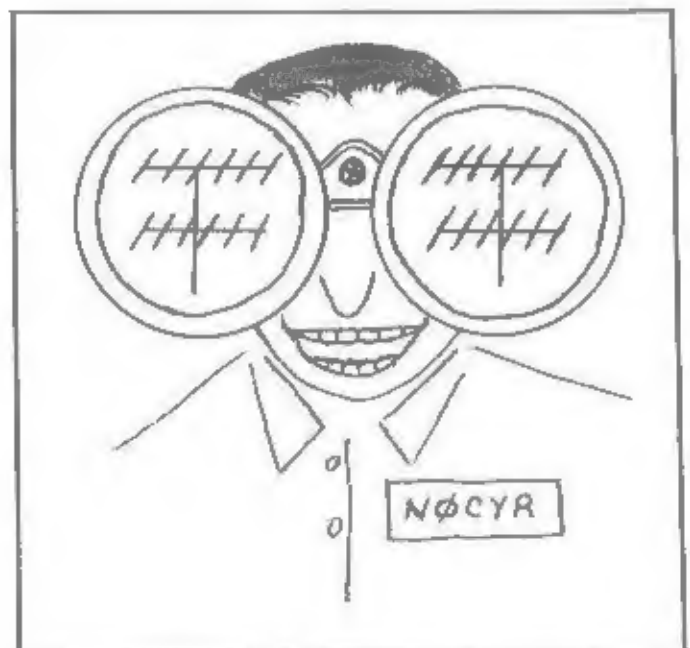
Pete NOLA: Club trailer needs a work party.

There were 11 guests at the meeting.

Prizes - Don WBQHW: To the delight of everyone, Don conducted the presentation of prizes along the lines of "Let's Make a Deal". Winners were:

Larry NOAMP - club jacket
Ken NOFRQ - connector + \$10.00
Ralph KAOMTX - connector
Woody KOWVB - computer disk
Rick WBOTHT - connector

Guest Speaker. Don KBOKQ presented an excellent talk on astronomy. He offered many suggestions on the best way to get started, and discussed some of the real pleasures that astronomy has to offer. He passed around a number of excellent astronomy books. He was even brave enough to pass around his huge expensive binoculars. Well done Don!



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Kenwood AT 250 ultra antenna tuner for 430S \$290.
Kenwood AT 130 tuner \$125 AT 290 Tuner \$170.
New Icom 715 \$710.
Icom 745 \$765.
Yaesu FT 757GX \$699.
New "Amp Supply" LA 1000NE 160-15 meter 120W PEP-800 LC
QSK, no tune up, drives with 100W-list \$529 — SALE \$475.
Amp Supply LK500ZB w/o QSK in stock w/10 meters \$950.
Kenwood 400DA 2m & 440 FM xcvr. List \$699 Sale \$499 w/free tone encoder.
Kenwood TR 3600 440 MHz HT \$105.
Kenwood TR 2600A New HT \$290 with free extra battery.
New Kenwood TH21AT \$198 TH41AT \$209 — both with free extra battery.
Kenwood TM 2570A 70 watt 2 meter FM mobile \$479.
Kenwood TM 2550A 45 watt 2 meter FM mobile \$389.
Kenwood TM 2530A 25 watt 2 meter FM mobile \$349.
Santer 200 ET 2mtr. HT \$150.
Santer 400 ET 440 HT \$175.
Santer 201 w/2 number memory dialer-1 only \$285.
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New Aedien PCS 9000 \$285.
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Icom 4AT \$229.
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Icom 27A \$328/Icom 27H \$359.
Icom 47A \$398.
Icom 3200 2 meter/440 dual bander \$485.
Daiwa Meters, Switches & Rotors — In Stock.
Merge Amps — Low Prices.
New KDK FM 240 mini 25W w/TTM & LCD display, encoder/decoder \$295.
New Yaesu FT 209RH 5 watt FM HT \$289.
Yaesu FT 2700RH 2 m-70 cm dual bander full duplex-free encoder \$499 — 1 only.
Now a factory dealer for Ten Tec — In stock specials:
Corsair II HF xcvr. \$1125.
Argosy II HF xcvr. \$559.
Century 22 HF CW xcvr. 349.
KR1B dual paddle memory keyer \$54.
Demo Corsair II \$995.
Ten Tec 260 p.p. \$150.
New generation Ten Tec 2591 2 m HT \$249 — 2 only.
Astron PS — ALL AMPS — Low Prices — Astron RS 50 In Stock.
Burrnutt HF6V 80-10 mtr. vertical \$115. 160 mtr. adapter \$50.
KLM 160V 160/80/40 vertical \$86.
KLM 2M14C 2 mtr. circ. 14 ele. beam (oscar) \$88.
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Welz top meters in stock.
Now a distributor for Ameritron Amplifiers — AL 80A In Stock \$649.
AEA CP-1 Computer Interface \$210.
AEA PK 64 packet/cw/rtty etc. controller \$399 — HFAM \$90.
AEA PK 64 system w/HFM 64 installed \$295.
Factory Dealer for Kantronics — In Stock!
New Kantronics Packet Program—includes program for LUTU.
Kantronics Packet Controller version 2 w/HFM \$195.
Kantronics Interface for VIC 20 and others \$125.
Kantronics Universal Terminal Unit \$165.
Kantronics Hamtext Hamsoft \$89.
MFJ wet & dry dummy loads — in stock.
MFJ Tuners and Keyers — in stock.
MFJ 989 roller inductor tuner \$288.
MFJ 962 1.5 KW tuner-160 to 10 meters \$219.

New MFJ 1224 interface in stock w/free soft program \$90.
MFJ 1229 interface w/free soft program \$160.
Available Mid April-MFJ 1270 packet controller (TNC-2)
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USED EQUIPMENT

Kenwood TR 2600 \$125.
Kenwood TR 2500 \$195.
Kenwood TR 3500 \$225.
Kenwood TR 3600 like new \$275.
Kenwood TR 9000 all mode mobile \$275.
Kenwood TR 7950 \$275.
Kenwood TR 7800 \$150.
Kenwood VFO 230 \$165.
Kenwood 1399/R399 twins w/xcv, cables \$395.
Kenwood TS 930S w-AT — nice in box \$995.
Kenwood TS 430S w/AM, CW & SSB filters \$595.
Kenwood PS 30 power supply \$100.
Icom 2AT \$150.
Icom 4AT Detro \$195.
Icom 730 \$425.
Icom PS 15 power supply \$95.
HC 730 & PS 15 combo for \$500.
Icom 745 \$575.
Icom PS 20 p.s. \$150.
combo price \$700.
Yaesu FV 101B ext. VFO \$75.
Yaesu FT400R 2 mtr. all mode \$275.
Yaesu FT2100B New in box \$375.
Yaesu FT2100B used, mint \$325.
Yaesu FT-2 Auto 8 channel scanning xtal. 2 mtr. 110/220/13.8V base/mobile \$75.
Leader LAC 895 tuner 80-10 mtr. \$75.
Heath HL 2200 (2) 3-500Z 2KW PEP, built by expert \$725.
KLM 2-140 2 meter FM only amp. 2 in/140 out \$115.
KLM PA 10-40 2 mtr. amp. 10 in, 40 out \$55.
KLM PA 10-35/C 440 FM amp. 5-15 in, 35 out \$65.
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